Swedish National Diabetes Register (NDR) for 35,238 persons with type 2 diabetes aged 30-74 years at diagnosis from January 1, 2004 to December 31, 2008 were analyzed using the conditional non-frailty Weibull model. To not underestimate the effect of BMI, two specifications of the model were estimated. Age at diagnosis, sex, hypoglycaemic treatment, diabetes duration, microalbuminuria and smoking were common covariates in both models. **RESULTS:** A total of 1409 patients had one MI event and 200 experienced two events. The results showed that the risk of a second MI differ from the risk of having a first MI. In addition, the effects of covariates were not constant between multiple events. Women had a lower risk for developing a first event compared to men, but a higher risk for a second event conditional on the first MI. Preliminary results indicate four times higher hazard of developing a MI conditional on a first MI during the follow up. **CONCLUSIONS:** The findings show the need for an update of simulation models including health-economic models and risk engines to include separate transition probabilities for first and subsequent events for correct predictions of costs and quality of life gains. Using recurrent event risk equations may reduce the bias from the previous assumption of constant transition probabilities for consecutive events in health economic models.

Cardiovascular Disorders – Cost Studies

PCV38

BUDGET IMPACT OF CHANGING FUTURE STATIN USE PATTERNS IN SWEDEN

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OBJECTIVES: To assess the health and budget impact of increasing use of rosuvastatin in patients with high cardiovascular risk, while maintaining the overall level of use, upon the entry of generic atorvastatin in Sweden. **METHODS:** A model was developed to estimate the budget impact associated with changed statin utilization pattern in different risk groups. The Framingham Risk equation was used to estimate cardiovascular events, and the relative risk reduction for statins was modeled using the JUPITER (Justification for the Use of statins in Primary prevention: an Intervention Trial Evaluating Rosuvastatin) trial. A similar relative risk reduction was used for primary and secondary prevention settings based on available literature. Baseline risk distribution was derived from the Malmö Primary Prevention Study. The use of rosuvastatin was assumed to increase from 4% (2011) to 7% (2014) in the high-risk group (27% baseline 10-year Framingham risk), but the overall use was kept unchanged (4%). A gradual atorvastatin use increase was assumed with a corresponding decrease in simvastatin use over 3 years. Cost calculations were from Swedish public health sources. Generic price for atorvastatin was assumed to be 5% of branded price. **RESULTS:** For the Swedish population on statin treatment (810,304 patients, 25% with a previous history of CVD) the estimated budget impact decreased by SEK 359 millions in 2012 (compared with 2011) and by SEK 441 millions in 2014 with changed statin utilization. The estimated number of CVD events avoided ranged from 98 in 2012 to 197 in 2014 compared with current year (0.81% decrease over the 3-year period). **CONCLUSIONS:** A shift to generic atorvastatin in 2012, accompanied by increased use of rosuvastatin in high-risk patients whilst maintaining rosuvastatin overall use at current levels, was estimated to prevent more cardiovascular events and resulted in overall healthcare budget savings for the 3-year period in Sweden.

PCV39

HEPARIN-INDUCED THROMBOCYTOPENIA TYPE II IN TIMES OF DEMOGRAPHIC CHANGES – EPIDEMIOLOGICAL AND ECONOMIC ASPECTS IN GERMANY

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OBJECTIVES: The antibody-mediated, prothrombotic heparin-induced thrombocytopenia type II (HIT-II) is a life-threatening disease with high thrombosis risk of 38-76% and up to 20% mortality. Pulmonary embolism occurs in up to 40% of patients, and amputations are necessary in up to 15%. The objective was to evaluate frequency and cost of HIT-II in Germany. **METHODS:** Systematic literature searches regarding epidemiology and cost of HIT-II were conducted until end of 2000 with Medical Subject Heading terms “incidence”, “epidemiology”, “risk”, and “cost” each in combination with “heparin-induced thrombocytopenia”. German secondary data were obtained by desktop research from the German Federal Statistical Office and a German university hospital. **RESULTS:** Literature search yielded eleven relevant publications selected by successive title, abstract and whole publication screening from a total of 1225 hits. Published incidence for HIT-II in Germany was 0.039% for in-hospital patients, and average additional costs per patient amounted to €9004 (Wilke et al., J Thromb Haemost, 2009). Data from the German Federal Statistical Office for 2009 show an incidence of 0.05% for patients with secondary diagnosis HIT-II, ICD-10 Code D69.53, corresponding to 8,585 cases (age peak 65-85 years) with an average prolongation of hospital stay by 18 days. The frequency of documented HIT-II as secondary diagnosis increased since 2005 by 60.4% (2005: 5353; 2006: 6263; 2007: 7177; 2008: 7454 cases). Estimated additional costs generated by HIT-II in Germany in 2005 amount to 48 million euro, and in 2009 to a minimum of 77 million euro. **CONCLUSIONS:** Cost and burden of HIT-II are considerable. Due to the demographic development to be expected in Germany during the next decades in combination with the age peak of the disease a further increase in HIT-II cases has to be anticipated. Data are limited. Further epidemiological research and analysis of burden of disease from several perspectives are needed.

PCV40

BUDGET IMPACT MODEL AFTER THE INTRODUCTION OF VERNAKALANT IN SPAIN

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OBJECTIVES: To estimate the hospital impact with the introduction of vernakalant in hospital emergency departments (EDs) in Spain. **METHODS:** Patients with recent onset atrial fibrillation (AF) (<48H) or non-permanent AF without thromboembolic risk (anticoagulation or negative transesophageal echocardiography) were included in the ED setting. Scenario: Data derived from the RHYTHM-AF-Spain study or determined by the hospital. Budget impact model with the following variables: percentage of use of anti-arrhythmic drugs (AAD) before and after the entry of vernakalant, time to cardioversion with AAD and number of patients per year that could be treated with vernakalant. Outcome variables: impact on pharmacy budget, length of stay in ED (cost offset, additional patients treated in ED). Time to achieve sinus rhythm for vernakalant, drug cost, and hospital stay were obtained from published data. **RESULTS:** According to Spanish RHYTHM-AF study data, in 67% of these patients cardioversion (CV) is attempted with the following AAD (proportion; mean time to normal sinus rhythm): amiodarone iv (55%; 7 hours), flecainide iv/oral (12%/28%; 1.5/4.2 hours), propafenone iv/oral (1%/4%; 2/6.1 hours). It is estimated that in a hospital like those enrolled in RHYTHM-AF, approximately 150 patients per year would be admitted into the ED and pharma-cardioversion would be attempted in 101. Assuming that AADs were partially substituted for vernakalant (30% for amiodarone, 15% flecainide oral, 5% flecainide iv, and 5% propafenone oral), 22 patients would receive vernakalant per year. The annual incremental cost is €7,772.13, but offset in 63.4% due to a reduction of 123.16 hours of stay in the ED that would also allow for the assistance of 15 additional patients. **CONCLUSIONS:** The reduction of hospital stay associated with the use of vernakalant carries a high percentage of compensation costs associated with reduction of stay in the ED and frees up resources to attend to more patients.

PCV41

THE BUDGETARY IMPACT OF IMPLEMENTING A TELEHEALTH HOME MONITORING SYSTEM FOR CHRONIC HEART FAILURE PATIENTS IN A TYPICAL UK PRIMARY CARE TRUST

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OBJECTIVES: There has been enormous interest in the potential benefit, primarily around decreased medical resource use, of the introduction of telehealth home monitoring systems (THMS) for chronic disease management. Widespread adoption has nevertheless been slow due to a lack of information on the financial implications of implementation. THMS requires a substantial initial investment which in a time of budget cuts needs economic justification. The objective of this study was to provide an estimate of the potential short-term financial implications of introducing the Care Innovations™ Guide THMS for patients with chronic heart failure (CHF) in a typical PCT within the UK. **METHODS:** A one-year budget impact model was developed looking at key financial drivers of CHF care including GP visits, unplanned hospitalisation, ambulance time, etc. The model assessed the impact on these costs after the introduction a THMS package for a PCT with a population of 500,000, assuming the initial THMS uptake would be 30% of CHF patients. Population and disease incidence and prevalence data for England were taken from the Quality and Outcomes Framework 2009-10. Average costs per unit of medical resource use, amount of resource use per year for a typical chronic CHF patient receiving standard care and estimates of the impact of the THMS on resource use were estimated from published literature. **RESULTS:** The model estimated that the introduction of THMS required an initial investment of £9,440,567 but yielded a return of 2% (£158,812) within one year. **CONCLUSIONS:** The introduction of THMS requires considerable initial investment; however this model suggests that this is offset within a very short time-frame due to reductions in medical resource usage and is expected to lead to substantial savings over the medium-term. This should encourage decision-makers to seriously consider moving from small pilot studies to more widespread implementation of THMS.

PCV42

A BUDGET IMPACT ANALYSIS TO ESTIMATE THE ECONOMIC IMPACT OF SEVIKARHCT® FOR THE TREATMENT OF ARTERIAL HYPERTENSION IN SPAIN

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OBJECTIVES: To assess the economic impact of adding SevikarHCT® to the Spanish market for the treatment of arterial hypertension in the adult population aged over 35. SevikarHCT® concerns a new three-in-one combination tablet containing olmesartan medoxomil, amlodipine and hydrochlorothiazide. **METHODS:** To estimate the economic impact a budget impact was developed using the Spanish national healthcare system (NHS) perspective and a 3-year time horizon. The patient population was estimated based on disease prevalence, population growth and data on the currently treated population with combinations of receptor blockers of the antagonists of the angiotensin II (ARBII) with calcium channel blockers (CCB) alone or together with diuretics (DIU) in fixed doses. Costs considered in this model included drugs actually marketed or over the next three years consisting of Balzak®, Balzak plus®, Capenon®, CapenonHCT®, Copalia®, CopaliaHCT®, Dafiro®, DafiroHCT®, Exforge®, ExforgeHCT®, Imprida®, ImpridaHCT®, Twynsta®, Sevikar® and SevikarHCT® expressed in EUR 2010. Based on the annual drug costs per patient and market shares for each treatment the economic burden before and after the introduction of SevikarHCT® was estimated. A drop of 28% in drug prices

was assumed when generic alternatives became available. **RESULTS:** The Spanish population with arterial hypertension over 35 years treated with combinations of ARBII and CCB with or without DIU was estimated at 990,000 patients in 2010, expecting to rise to 1.17 million patients in 2013. Total treatment costs for hypertension treatment over the next 3 years were estimated at €1.638 million before the introduction of SevikarHCT® and at €1.649 million after introduction. **CONCLUSIONS:** Although the introduction of SevikarHCT® adds incremental costs for the Spanish NHS, a decrease in the overall economic burden with or without the introduction of SevikarHCT® was observed from 2010. These budget savings can be explained by the effect in price drop caused by the availability of generics.

PCV43

BUDGET IMPACT OF THE IMPLEMENTATION OF A TREATMENT PROTOCOL FOR PULMONARY ARTERIAL HYPERTENSION IN A REFERRAL HOSPITAL

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OBJECTIVES: To examine evidence on efficacy and safety of oral drugs for pulmonary arterial hypertension (PAH). Analyze their utilization and their cost. To propose a treatment protocol based on efficacy, safety and efficiency. Calculate the estimated budget impact after its implementation. **METHODS:** A search was conducted in MEDLINE, EMBASE and Cochrane Database. Systematic reviews and meta-analysis of bosentan, ambrisentan, sildenafil or tadalafil in PAH (functional class II/III) were included. Their utilization was analyzed retrospectively in patients with primary or associated with connective tissue diseases pulmonary hypertension that started treatment during 2008 to 2010. The annual cost per patient for each alternative was calculated (standard dosage). A treatment protocol was developed, based on efficacy, safety, and efficiency. The incremental cost for each drug, and the potential savings if all patients start their treatment with the most cost-effective were calculated. **RESULTS:** No evidence was found to support the superiority of any treatment over another, in terms of efficacy and/or safety. Seventeen patients started treatment during the study period (47% bosentan, 41.2% sildenafil, 11.8% ambrisentan). Estimated annual cost per patient: 30,987.07, 26,861.93, 7,807.74 and 6,865.65 €, for bosentan, ambrisentan, sildenafil and tadalafil, respectively. In absence of significant differences in efficacy or safety, the treatment protocol was based on efficiency (sildenafil> tadalafil> ambrisentan> bosentan). Incremental cost (compared to sildenafil): 24,121.42, 19,996.28 and €942.09 for bosentan, ambrisentan and tadalafil, respectively. Estimated potential savings with implementation of protocol: 77,654.64 €/ year. **CONCLUSIONS:** No evidence supports the superiority of any treatment over another, so they could be considered equivalent therapeutic alternatives. Bosentan is most widely used drug in naïve patients. The cost associated with bosentan/ambrisentan is markedly greater to sildenafil/tadalafil. Establishing a protocol that prioritizes sildenafil/tadalafil use would help to more efficient management of resources.

PCV44

COST-UTILITY ASSOCIATED WITH DIFFERENT MONITORING STRATEGIES AMONG PATIENTS RECEIVING LONG-TERM ORAL ANTICOAGULATION THERAPY IN AUSTRIA

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OBJECTIVES: To ascertain the cost-utility of patient self-management (PSM) compared to standard monitoring among long-term oral anticoagulation therapy patients in Austria. **METHODS:** A Markov model was used to combine international effectiveness data and local cost and mortality data in a life-long simulation (closed cohort with a mean baseline age of 67 years). Costs were calculated using information on healthcare contacts from healthcare professionals and associated tariffs. Costs for standard monitoring were based on monthly visits to primary/outpatient settings and determination of PTZ levels. PSM costs included costs of the handheld device, materials, training and regular healthcare check-ups. Costs associated with complications (thrombotic and haemorrhagic events) in primary-care, acute care and rehabilitation settings were also considered, since complications occur at different rates between monitoring strategies. Sensitivity analyses were performed. **RESULTS:** PSM was associated with 15.9 life years or 10.7 QALYs compared to 14.6 life years or 9.4 QALYs with standard monitoring. Costs per patient for the entire period were €7,873 for PSM, €8,170 for monitoring by GPs, €8,354 for monitoring by community-based consultants and € 8,810 for monitoring at a hospital out-patient clinic. PSM was the dominant strategy for both the cost per life-year gained and cost per QALY analysis. Although PSM led to higher initial costs (between €908 and €916 per patient in the first year), follow-up costs were lower (between €228 and €235 per patient per year thereafter) due to lower frequency of health care visits. Standard monitoring was associated with monitoring costs of between €273 and €391 per patient per year. **CONCLUSIONS:** Encouraging suitable patients to self-manage leads to better health outcomes and lower costs. In Austria, initial costs are compensated by lower complication rates and associated costs and lower monitoring expenses. Cost-savings to the health sector could be accrued as soon as 3 years after patients switch strategies.

PCV45

HEALTH ECONOMIC EVALUATION OF TICAGRELOR IN PATIENTS WITH ACUTE CORONARY PATIENTS (ACS) BASED ON THE PLATO STUDY FROM A SPANISH HEALTH CARE PERSPECTIVE

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OBJECTIVES: PLATO was a multi centered, double blind, randomized study that included 18,624 ACS patients from 43 countries, comparing ticagrelor + aspirin versus clopidogrel + aspirin. The PLATO demonstrated that ticagrelor was superior on the primary composite endpoint: myocardial infarction, stroke, cardiovascular death (HR 0.84, 95% CI: 0.77 to 0.92) without an increase in major bleedings compared to clopidogrel, and whether the strategy of choice was invasive or conservative. The aim of this analysis is to estimate direct health care costs from a Spanish health care perspective (excluding drug costs because ticagrelor price has not yet been established). **METHODS:** Resource utilization was pre specified in the PLATO trial and included hospitalization bed days, investigations, interventions and blood products. Direct health care costs per patient at 12 months were estimated by multiplying the resource use with Spanish unit costs derived from the Spanish database e-salud, the GRDs of the Ministry of Health, published literature, and the CMBD 2008. **RESULTS:** Ticagrelor resulted in numerically fewer bed days (mean difference per patient 0.21, 95% CI -0.16 to 0.59), PCIs (mean difference per patient 0.01, 95% CI -0.01 to 0.03) and CABGs (mean difference per patient 0.01, 95% CI: 0.00 to 0.01). Ticagrelor is associated with €341 reduction per patient (95% CI: 31 to 652) in healthcare costs at 12 months compared to clopidogrel. The reduction in healthcare costs was mainly due to fewer hospital days and cardiovascular interventions in the ticagrelor group. The reduction in cost increased over the 12-month treatment period consistent with the rate of clinical events over time in the PLATO study. **CONCLUSIONS:** Treatment with ticagrelor is associated with cost savings in patients with ACS at 12 months compared with clopidogrel (excluding drug costs) from a Spanish health care perspective. However, the total cost savings will depend on drug price, data not available yet.

PCV46

CLINICAL AND ECONOMIC BURDEN OF MAJOR BLEEDING IN ABDOMINAL SURGERY PATIENTS

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OBJECTIVES: To assess the clinical and economic burden of major bleeding in abdominal surgery patients. **METHODS:** A retrospective study (January 1, 2005 to December 31, 2007) was conducted using a medical claims database. Patients included in the study were admitted to the hospital with abdominal surgery as their primary procedure. Patients' demographic, clinical and discharge statuses were compared using Chi-square testing and standardized differences. Risk-adjusted health care visits and costs were estimated using the General Linear Model (GLM). Potential risk factors for venous thromboembolism (VTE) events were selected using the Cox Proportional Hazard Regression Model. **RESULTS:** In patients identified with abdominal surgery (n=49,355), 773 (1.57%) suffered major bleeding in the 6-month follow-up period. Compared with patients who did not suffer major bleeding, patients who did were more likely to be older, have higher Charlson Comorbidity Index (CCI) scores and have other comorbid conditions such as cancer. The percentage of patients who had baseline emergency room (ER) visits was also higher in the major bleeding group. After risk-adjustment for pre-specified covariates, inpatient ($21,573 vs. $10,954), outpatient ($12,891 vs. $7,852) and pharmacy costs ($2,025 vs. $1,901) were higher for patients who suffered major bleeding. In addition, patients with major bleeding events had higher readmission rates (0.11% vs. 0.03%) during the follow-up period. **CONCLUSIONS:** Since the health care costs of patients with major bleeding events were significantly higher than those of patients without, it is important for individual hospitals to improve major bleeding prophylaxis therapy.

PCV47

ANALYSIS OF TRANSIENT ISCHEMIC ATTACK-RELATED CLINICAL OUTCOMES, HEALTH CARE UTILIZATION AND COST BURDEN OF PATIENTS WITH NON-VALVULAR ATRIAL FIBRILLATION

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OBJECTIVES: To estimate clinical outcomes, health care utilization and cost burden of patients who suffered a transient ischemic attack (TIA) during the 180 days after a diagnosis of non-valvular atrial fibrillation (NVAF) and compare it with patients who did not. **METHODS:** Based on 2005-2007 US insurance claim files, patients aged 65 years and older who have had two or more primary diagnoses of NVAF, occurring within 30 days of one another, were selected. The 180 days follow-up event rates, health care facility use and costs for patients with and without a TIA were compared. Risk adjustment was performed using the propensity score matching (PSM) method with the ProbChoice™ algorithm. **RESULTS:** A total of 18,575 patients were identified with NVAF, of which 163 (0.88%) suffered a TIA during the 180 days after the NVAF diagnosis. Patients were not significantly different in terms of gender, region, and baseline comorbid conditions. After PSM risk-adjustment for pre-specified covariates, outpatient emergency room (ER) visits (85.89% vs. 48.47% $p<0.0001$), cardiovascular-related length of stay (6.59 days vs. 5.57 days, $p<0.0001$) and ischemic stroke events (89.57 vs. 8 /100 person years, $p<0.0001$) were higher for patients who suffered a TIA compared to those who did not. Although risk-adjusted outpatient office visit, international normalized ratio (INR) testing, Coumadin outpatient visit, drug and other costs did not differ significantly between the two groups, patients who suffered a TIA had significantly higher inpatient ($21,740 vs. $22,663, $p<0.0001$) and total ($31,675 vs. $18,045, $p<0.0001$) expenditures. **CONCLUSIONS:** After adjusting for patient clinical and